

**ACUTE EXPOSURE GUIDELINE LEVELS
FOR
SULFUR CHLORIDE
(CAS NO. 10025-67-9)**

PRESENTED BY

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**SULFUR CHLORIDE
CAS NO. 10025-67-9**

COMMON SYNONYMS:

Sulfur monochloride, disulfur dichloride

PHYSICAL CHARACTERISTICS:

- Light amber to yellowish red, fuming, oily liquid
- Vapor pressure: 6.7 torr @ 20°C
- Vapor density: 4.66 (air = 1)
- Soluble in organic solvents
- Conversion: 1 ppm = 0.181 mg/m³

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DESCRIPTION

- Decomposes primarily to hydrogen chloride, sulfur dioxide, and sulfur in water or moist environment
- ODOR: irritating, suffocating, penetrating, nauseating
- ODOR DETECTION THRESHOLD: No data

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HUMAN DATA

- Irritation threshold: 2-66 ppm
- Considered an upper respiratory tract irritant in humans
- Upper respiratory tract irritation may be due to decomposition products

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ANIMAL DATA

Bomhard et al., 2000

- **Study type:** 4-hour inhalation
- **Species/Strain:** rat/strain not reported
- **Sex:** males and females
(5 of each sex/group)
- **Observation period:** 14 days
- **Endpoints:** clinical signs, body weight, mortality, gross pathologic changes

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Results

44 ppm no effects

1016 ppm no effects

7369 ppm bloody and serous nasal discharge, breathing difficulty, piloerection, reduced activity, and ungroomed fur (signs of discomfort)

9511 ppm same as 7369 ppm but probably more severe, no deaths

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Results (Cont.)

13,800 ppm: 3/10 died, breathing difficulty, cyanosis, corneal opacity, necrosis in the nose; emphysema, pulmonary edema, effects in liver and spleen, gastrointestinal irritation.

15,842 ppm: 6/10 died; other effects same as described above

19, 248 ppm: 10/10 died; other effects same as described above

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AEGL -1 VALUES

10 min	30 min	1 hour	4 hour	8 hour
20 ppm [3.6 mg/m ³]	20 ppm [3.6 mg/m ³]	16 ppm [2.9 mg/m ³]	10 ppm [1.8 mg/m ³]	5.1 ppm [0.9 mg/m ³]
Key Reference: Bomhard, E.; Loser, E., and Pauluhn, J. 2000. Acute toxicologic evaluation of disulfur dichloride. Int. J. Toxicol. 19: 342.				
Endpoint/Concentration/Rationale: NOEL for upper respiratory irritation, breathing difficulty, signs of discomfort in rats exposed to 1016 ppm for 4 hours				
Uncertainty Factors/Rationale:				
Total uncertainty factor: 100 (default)				
Interspecies: 10 (default)				
Intraspecies: 10 (default)				
Modifying Factor: 1				
Time Scaling: $C^n \times t = k$, $n = 3$ and $n = 1$ when scaling to shorter and longer durations, respectively (default)				

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AEGL -2 VALUES

10 min	30 min	1 hour	4 hour	8 hour
74 ppm [13 mg/m ³]	74 ppm [13 mg/m ³]	58 ppm [119 mg/m ³]	37 ppm [6.7 mg/m ³]	18 ppm [3.3 mg/m ³]
Key Reference: Bomhard, E.; Loser, E., and Pauluhn, J. 2000. Acute toxicologic evaluation of disulfur dichloride. Int. J. Toxicol. 19: 342.				
Endpoint/Concentration/Rationale: Upper respiratory irritation, breathing difficulty, signs of discomfort in rats exposed to 7369 ppm for 4 hours				
Uncertainty Factors/Rationale:				
Total uncertainty factor: 100 (default)				
Interspecies: 10 (default)				
Intraspecies: 10 (default)				
Modifying Factor: 2				
Time Scaling: $C^n \times t = k$, $n = 3$ and $n = 1$ when scaling to shorter and longer durations, respectively (default)				

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AEGL -3 VALUES

10 min	30 min	1 hour	4 hour	8 hour
180 ppm [33 mg/m ³]	180 ppm [33 mg/m ³]	143 ppm [26 mg/m ³]	90 ppm [16 mg/m ³]	45 ppm [8.1 mg/m ³]
Key Reference: Bomhard, E.; Loser, E., and Pauluhn, J. 2000. Acute toxicologic evaluation of disulfur dichloride. Int. J. Toxicol. 19: 342.				
Endpoint/Concentration/Rationale: Threshold for lethality ($LC_{01} = 9014$ ppm) for a 4-hour exposure; the LC_{01} is slightly below the highest conc. that did not cause death.				
Uncertainty Factors/Rationale:				
Total uncertainty factor: 100 (default)				
Interspecies: 10 (default)				
Intraspecies: 10 (default)				
Modifying Factor: 1				
Time Scaling: $C^n \times t = k$, $n = 3$ and $n = 1$ when scaling to shorter and longer durations, respectively (default)				

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DATA ADEQUACY FOR SULFUR CHLORIDE

Only one acute inhalation study was available for deriving AEGLs.

The study showed clear concentration-response relationships for lethal and non-lethal effects.

The report provided no information on exposure conditions, analytical verification of chamber concentrations, or estimates of decomposition products.

Default uncertainty factors were used in acknowledgment of the lack of additional data.

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Proposed AEGL Values For Sulfur Chloride (ppm [mg/m³])

Class.	10 min.	30 min.	1 hour	4 hours	8 hours	Endpoint
AEGL-1	20 [3.6]	20 [3.6]	16 [2.9]	10 [1.8]	5.1 [0.9]	No effect level
AEGL-2	74 [13]	74 [13]	58 [11]	37 [6.7]	18 [3.3]	Upper respir. irrit. & dyspnea
AEGL-3	180 [33]	180 [33]	143 [26]	90 [16]	45 [8.1]	Lethality threshold

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